ASCE-INDOT
STRUCTURAL SUBCOMMITTEE
MEETING NO. 37 MINUTES
September 6, 2007

The meeting was called to order at 9:05 am by Steve Weintraut. Those in attendance were:

Anne Rearick	INDOT, Structural Services
Greg Klevitsky	INDOT, Structural Services
Naveed Burki	INDOT, Structural Services
Bill Dittrich	INDOT, Program Development
Jim Reilman	INDOT, Construction Management
Keith Hoernschmeyer	Federal Highway Administration
Mike McCool	Beam Longest & Neff, LLC.
Dick O'Connor	RQAW Corporation
Mike Obergfell	USI Consultants, Inc.
Mike Wenning	American Structurepoint, Inc.
Steve Weintraut	Butler, Fairman and Seufert, Inc.
Michael Matel	Butler, Fairman and Seufert, Inc.

In addition to the attendees, these minutes will be sent to the following:

Tony Uremovich	INDOT, Structural Services
Ron McCaslin	INDOT, Structural Services
George Snyder	INDOT, Structural Services
Chris Hill	Prestress Services
Tony Zander	INDOT, Materials and Tests Division
Jason Yeager	Gohman Asphalt Company
Burleigh Law	HNTB Corp.

A meeting agenda had previously been distributed and the following items were discussed:

1. The June 7, 2007 meeting minutes were approved as written, and will be placed on the INDOT website.

2. Mike Obergfell presented to the group an adhesive specification, which can be used to attach the material to the back of the end bent (Attachment 1). This specification will be presented to the INDOT Standards Committee as part of the semi-integral end bent detail package for approval. The group recommended that a Type C Certification be issued for this adhesive.

3. When using the RC-Pier program (Leap Software), designers have noticed that the amount of reinforcing steel required in the hammerhead portion of the pier has greatly increased due to the torsion requirements. Mike Wenning has investigated this topic further and feels that the pier program is adding the steel reinforcing, which is required to satisfy the torsion requirements, to the reinforcing steel which is currently required. The group felt that torsion should not be a significant factor in the reinforcing steel requirements for a hammerhead pier. With so much steel present in the hammerhead, this becomes more of a construction problem than a design problem. The group felt that a design memo should be written to provide designers

guidance as they encounter this in their design. Anne Rearick will discuss this topic with Tony Uremovich and present a rough draft of this memo to the group.

4. The group felt that the placement of reinforcing steel in the top portion of pier footings for temperature steel requirements was not necessary. The footing is only exposed for a short period of time before the fill is placed over it. It was felt that the designer needs to consider placing top reinforcing steel in the pier footing when uplift conditions are present. It was noted that for most pier footings, the top portion of the footing is in compression. The group felt that the Indiana Design Manual needs to be revised with regards to the "Z" factor in concrete footings, which is provided for crack control. Anne Rearick and Mike Wenning will review this topic and provide the group with the Design Manual modification.

5. At the current time, designers are required to design foundations using HS-25 loading, while all other components are being designed for LRFD HL-93. As a result, designers are required to look at various design load cases and room for error is increased. Anne Rearick will contact Athar Khan to inquire when INDOT Material and Tests will be implementing LRFD for foundation designs.

6. The detailing of the mild reinforcing steel around the bottom strands in precast concrete beams was discussed. Mike McCool presented a sample detail for this topic (Attachment 2). It was felt that the fabrication process is simplified when a single bar is used. It was proposed to change the wording in the Indiana Design Manual 63-5.01 to reflect this. It was pointed out that a stirrup bar was also placed on the top row of the bottom strands to encase these strands. Mike will prepare formal documentation of these revisions and get them forwarded to the INDOT Standards Committee.

7. Maintenance costs for "specialty" type structures are very difficult to come up with since so many variables are involved as well as there are not many of these structure types present in Indiana. It was requested that Bill Dittrich and Mike Obergfell collect some cost data for the various types of inspections on these "specialty" type structures. The group realized that these costs would be approximate and could be specified as a cost range. It was felt that any information that could be provided would be better than what is currently available to the designer. This information would aid the designer when evaluating the different structure types during the preliminary stages of project development.

8. The subject of construction loading was the next topic discussed. Currently most designers do not give much consideration to construction loads in their design, as well as provide much information on the plans. Designers and contractors need to work together to establish some guidelines. A subgroup consisting of Anne Rearick, Mike Obergfell, Mike McCool, Mike Wenning and Steve Weintraut was formed. This subgroup will meet with a group of contractors to discuss this topic as well as provide some guidelines and procedures for designers.

9. Additional training for designers on LRFD was discussed. Possible seminars presented by Eriksson Technologies, University of Cincinnati, as well as NHI courses were brought up. The group felt that this seminar needed to be in depth and realized that it would require several days of instruction. Anne Rearick will begin the process of making this seminar become a reality.

10. It was pointed out that in Indiana Design Manual Section 67-1.01(05), there exists an inconsistency between notes no. 2 and no. 3. Steve Weintraut will rewrite these notes and present them to the group at the next meeting.

11. Some details were presented for precast, prestressed concrete Hybrid Bulb-T beams (Attachment 3). These beam shapes are currently available from the precastors. The advantage to these beams is the reduced structure depth. These beams appear to be 10% to 20% more expensive than the similar bulb-T beams which are one foot taller in structure depth. The beam sizes and approximate span lengths are:

Beam Depth	*Approximate Span Length (Feet)
3'-0"	90-95
3'-6"	100-110
5'-0"	130-145
5'-6"	145-155

*Based on 9'-0" beam spacing

Some guidance will be provided to the designers for selecting these types of beams when more cost data is available. Anne Rearick will speak with Tony Uremovich to start the process of drawing up these beam standards.

12. At the next meeting, the topic of "Deck Overhang Design for Bulb-T Beams" will be discussed.

The next meeting for the INDOT Structural Subcommittee is scheduled for 9:00 am on December 13, 2007, in a location to be determined.

This meeting was adjourned at 12:15 p.m.

Respectfully submitted,
BUTLER, FAIRMAN and SEUFERT, INC.

Michael Matel, P.E.
mmatel@bfsengr.com

MM:lm

Attachments

ATTACHMENT No. 1

3M

Scotch-Grip™
Industrial Adhesive
4799

Technical Data **November, 2004**

Product Description

3M™ Scotch-Grip™ Industrial Adhesive 4799 can be used to bond most EPDM rubber, sponge rubber, rubber sheeting, felt, canvas, linoleum and other lightweight materials to many metals, woods, concrete and plastics.

Typical Physical Properties

Note: The following technical information and data should be considered representative or typical only and should not be used for specification purposes.

Viscosity (approx.) Brookfield Viscometer	7,500-18,000 cps. RVF #6 sp. @ 20 rpm
Solids (by wt.)	28-35%
Base	SBR
Color	Black
Net Weight (approx.)	6.6 - 7.0 lbs./gal.
Flash Point (closed cup)	-14°F (-26°C)
Solvent	Petroleum Distillate, n-hexane and toluene

Features

- Quick drying adhesive with fast strength buildup.
- Provides low soak-in on most porous substrate.
- Dries to a flexible, water resistant bond.

Scotch-Grip™
Industrial Adhesive
4799

Handling/Application Information

Directions for Use

1. **Surface Preparation:** Surfaces to be bonded must be clean, dry and dust free. Wiping with solvent such as 3M™ Scotch-Grip™ Solvent No. 3* will aid in removing oil and dirt.
2. **Application Temperature:** For best results the temperature of the adhesive and the surfaces being bonded must be at least 65°F (18°C).
3. **Application:** Stir or agitate well before using.

   Porous Surface(s): Brush a uniform, generous coat of adhesive on the least porous surface to be bonded. Assemble the materials immediately with sufficient pressure to ensure contact.

   Non-Porous Surface(s): Apply a uniform coat of adhesive to each surface. Allow adhesive to dry until it is tacky, but does not transfer. Assemble materials with sufficient pressure to ensure contact.
4. **Cleanup:** Excess adhesive may be removed with solvent such as 3M™ Scotch-Grip™ Solvent No. 3.*

***Note:** When using solvents, extinguish all sources of ignition in the area and follow the manufacturer's precautions and directions for use when handling such materials.

Application Equipment Suggestions

Note: Appropriate application equipment can enhance adhesive performance. The user is responsible for evaluating application equipment in light of the user's particular purpose and method of application.

1. **Pumping:** Use a 5:1 ratio double acting, ball check pump with a 3 inch diameter air motor. All packings and glands in contact with the adhesive should be Teflon® coated.
2. **Hoses:** Material hoses should be nylon lined with a working pressure of 500 psi or greater.
3. **Brushes:** Brushes designed for use with oil based paint may be used.

Typical Adhesive Performance Characteristics

Note: The following technical information and data should be considered representative or typical only and should not be used for specification purposes.

180° PEEL STRENGTH – Canvas/Steel		
Time @ 75°F (24°C)	Test Temp.	Value (lbs./in. width)
1 day	75°F (24°C)	15.5
3 days	75°F (24°C)	22
5 days	75°F (24°C)	25
7 days	75°F (24°C)	25.5
2 wk.	75°F (24°C)	27.5
3 wk.	75°F (24°C)	28
after 3 wk.	-30°F (-34°C)	14
after 3 wk.	150°F (66°C)	8.5
after 3 wk.	180°F (82°C)	5

Scotch-Grip™
Industrial Adhesive
4799

Storage

Store product at 60-80°F (16-27°C) for maximum storage life. Higher temperatures reduce normal storage life. Lower temperatures cause increased viscosity of a temporary nature. Rotate stock on a "first in-first out" basis.

Shelf Life

When stored at the recommended conditions and kept in the original, unopened container, this product has a shelf life of 1 year from date of shipment.

Precautionary Information

Refer to Product Label and Material Safety Data Sheet for health and safety information before using this product. For additional health and safety information, call 1-800-364-3577 or (651) 737-6501.

Product Use

All statements, technical information and recommendations contained in this document are based upon tests or experience that 3M believes are reliable. However, many factors beyond 3M's control can affect the use and performance of a 3M product in a particular application, including the conditions under which the product is used and the time and environmental conditions in which the product is expected to perform. Since these factors are uniquely within the user's knowledge and control, it is essential that the user evaluate the 3M product to determine whether it is fit for a particular purpose and suitable for the user's method of application.

Warranty and Limited Remedy

Unless stated otherwise in 3M's product literature, packaging inserts or product packaging for individual products, 3M warrants that each 3M product meets the applicable specifications at the time 3M ships the product. Individual products may have additional or different warranties as stated on product literature, package inserts or product packages. 3M MAKES NO OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR ANY IMPLIED WARRANTY ARISING OUT OF A COURSE OF DEALING, CUSTOM OR USAGE OF TRADE. User is responsible for determining whether the 3M product is fit for a particular purpose and suitable for user's application. If the 3M product is defective within the warranty period, your exclusive remedy and 3M's and seller's sole obligation will be, at 3M's option, to replace the product or refund the purchase price.

Limitation of Liability

Except where prohibited by law, 3M and seller will not be liable for any loss or damage arising from the 3M product, whether direct, indirect, special, incidental or consequential, regardless of the legal theory asserted, including warranty, contract, negligence or strict liability.

ISO 9001:2000

This Industrial Adhesives and Tapes Division product was manufactured under a 3M quality system registered to ISO 9001:2000 standards.

3M

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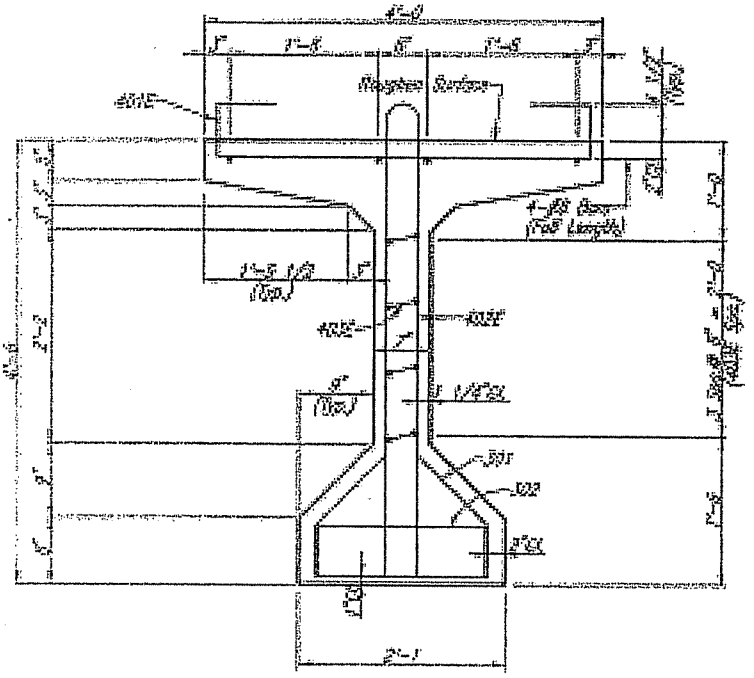
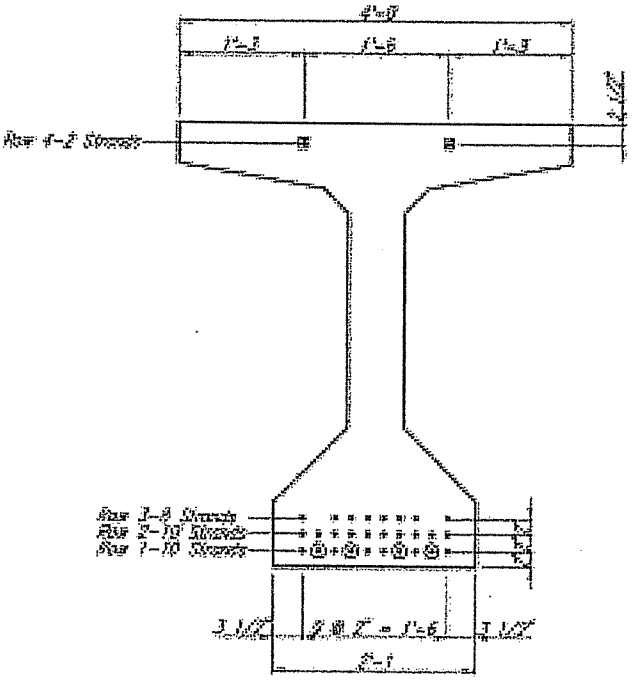
Recycled Paper
40% pre-consumer
10% post-consumer

ATTACHMENT No. 2

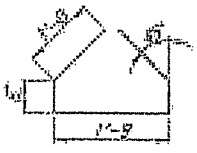


TYPICAL BEAM SECTION
Scale: 1"=1'-0

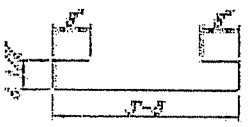


SECTION THRU BEAM
(Strand Pattern @ Beam End)
Scale: 1"=1'-0

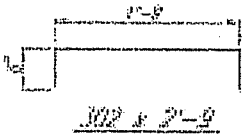
- ☐ Grout keyway to 3/4 after side of B Beam and cut strand @ B Beam after erected.
- ○ Indicates strands debonded 5'-0 from beam end



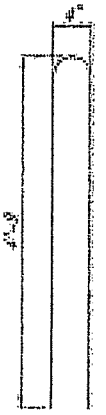
301 x 4'-8



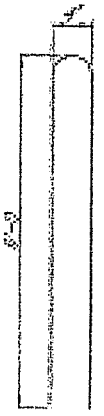
401E x 15'-1



302 x 2'-9



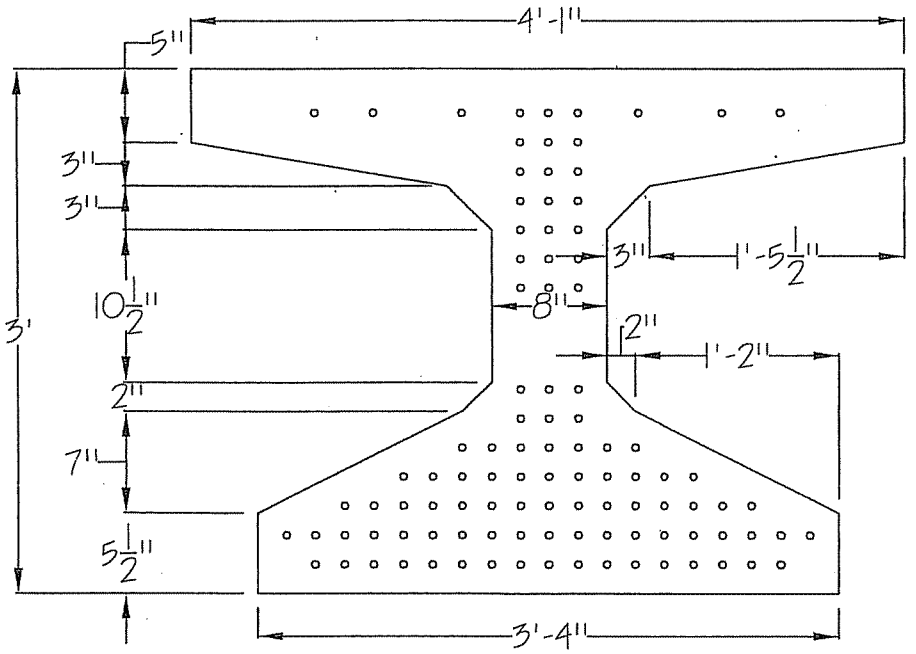
402E x 5'-8



402E x 12'-2

ATTACHMENT No. 3 HYB 36

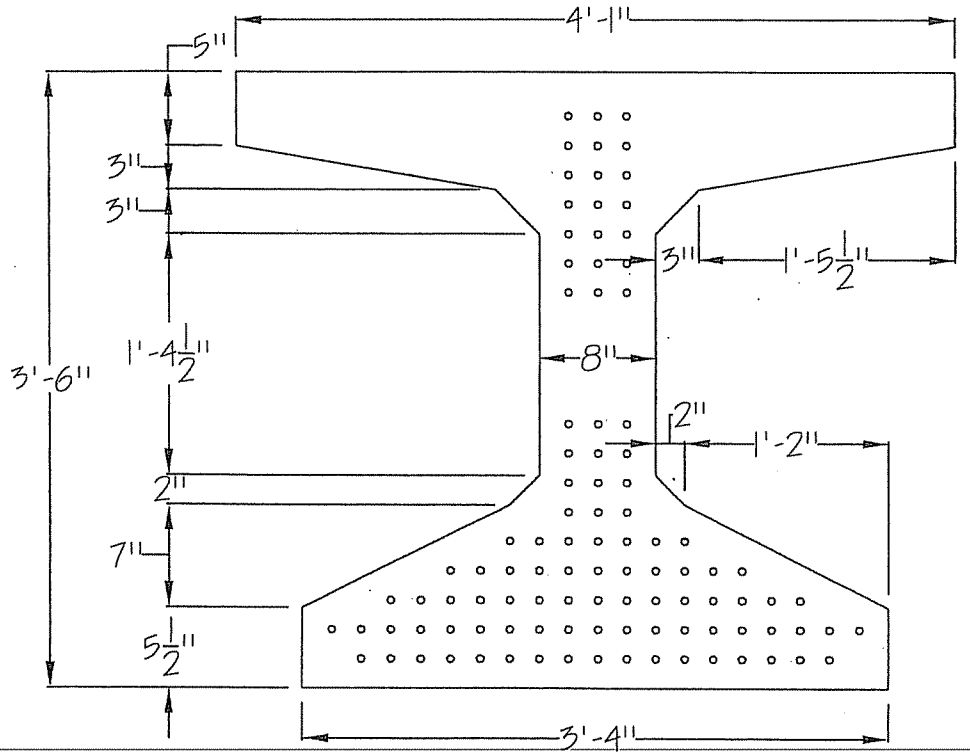
36" HYBRID BULB-T



A = 879 sqin
Wt = 915 lb/ ft
Yb = 18.17 in
Yt = 17.83 in
Ix = 145772 in^4
Iy = 102920 in^4
Sb = 8023.3 in^3
St = 8175.1 in^3
Vol/ Sur = 4.146 in

HYB 42

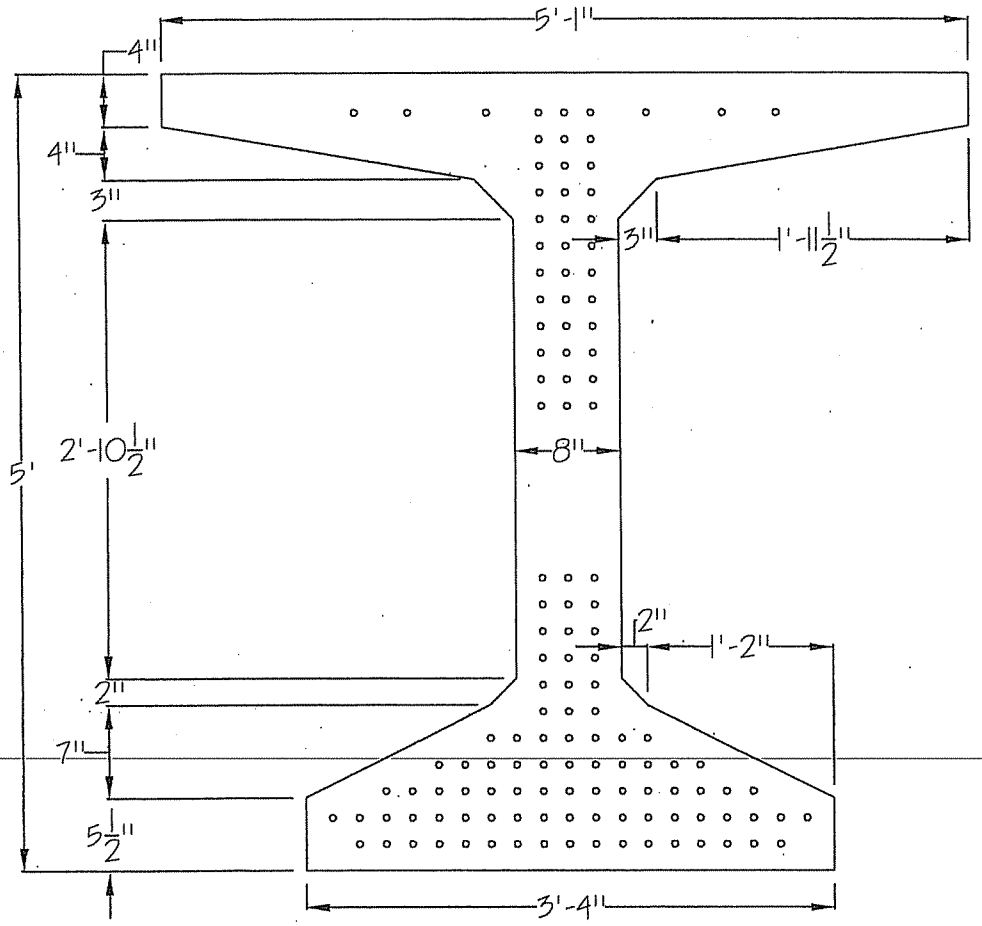
42" HYBRID BULB-T



A = 927 sqin
Wt = 965 lb/ft
Yb = 21.09 in
Yt = 20.91 in
Ix = 217705 in^4
Iy = 103176 in^4
Sb = 10323 in^3
St = 10412 in^3
Vol/Sur = 4.138 in

HYB60

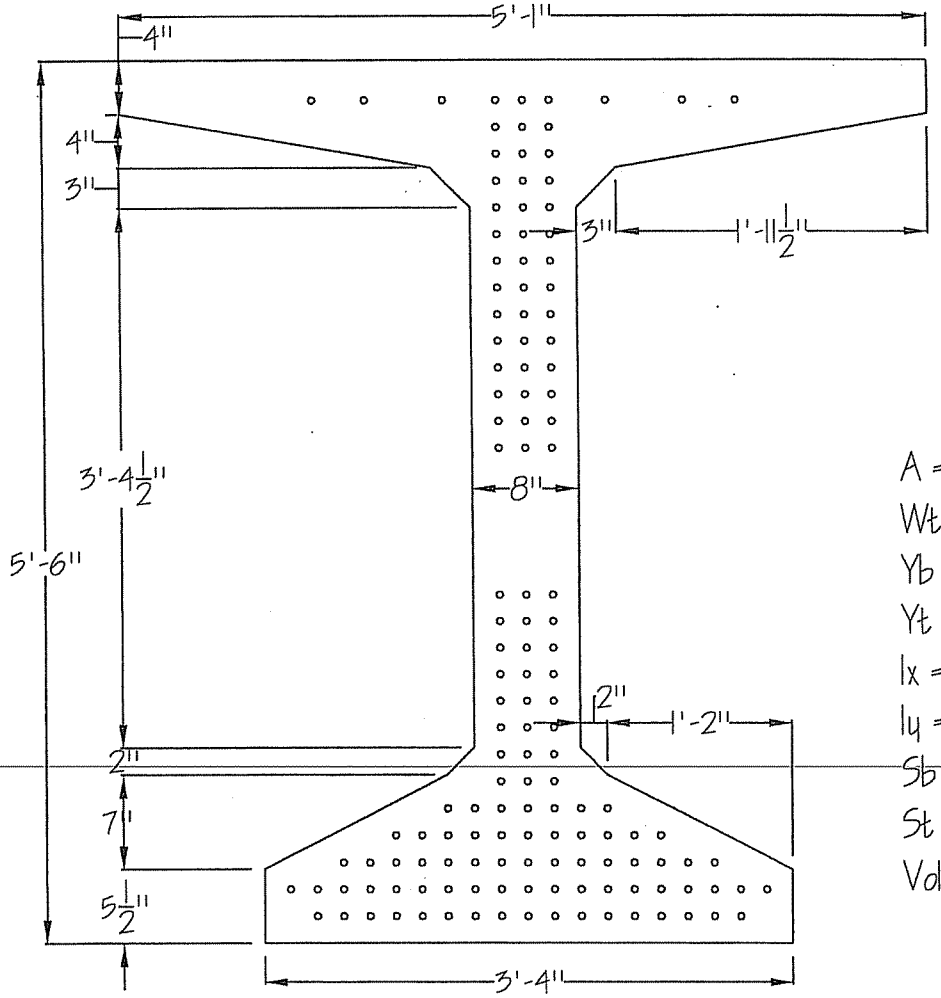
60" HYBRID BULB-T



A = 1125 sqin
Wt = 1172 lb/ft
Yb = 31.24 in
Yt = 28.76 in
Ix = 577017 in^4
Iy = 144703 in^4
Sb = 18470 in^3
St = 20063 in^3
Vol/Sur = 3.988 in

HYB66

66" HYBRID BULB-T



A = 1173 sqin
Wt = 1222 lb/ft
Yb = 34.27 in
Yt = 31.73 in
Ix = 730173 in^4
Iy = 144959 in^4
Sb = 21313.7 in^3
St = 23015.3 in^3
Vol/Sur = 3.988 in